A NEW AND USEFUL USE OF MECHANIC VIBRATION IN THETHERAPY OF DISCOGENIC PAIN OF DORSAL SPINE

Pâncotan Vasile, Ille Mihai, Cristea Dana, Tarcău Emilian, Deac Anca
University of Oradea
vasilepancotan@yahoo.com

Key words: *spine functions, degenerative rheumatism, mechanic vibrations, kinetic treatment*
Abstract. The aim is to emphasize mechanic vibrations in order to optimize intervertebral discus function in spine degenerative disorders. This is a new idea and it has become research subject for various mobile areas of the spine.

Hypothesis. Low and medium frequency mechanic vibrations applied on dorsal spine, can contribute on short term to the recovery of intervertebral discus shape and height, with positive effects in the treatment of pain generated by discus degenerative disorders of dorsal spine.
Material and method. We studied 50 patients with dorsal spine degenerative disorders aged between 18 and 29, 13 patients in groups A and B, and aged between 30 and 60, 5 days - kinetic program with vibrations: frequency 12 patients in groups C and D. 5 days, patients followed kinetic treatment without vibrations, amplitude = vibration force and exposal time had been established with the patient.
Results. After treatment, pain behavior was as follows: Group A – pain decreases with 42%; Group B –with vibration, pain decreases 41,3%. Group C –and after treatment with vibration, pain decreases with41,1%. Group D = pain is the same, and after treatment with vibration, pain decreases with 37%.
Conclusions. Treatment with mechanic vibrations is efficient, can be easily applied and without riscs, in pain due to degenerative disorders in early stages, but also in advanced ones, with positive effects in pain fight.

Prerequisites:

- Compared to the kinetic treatment (without vibrations) which accomplishes other important objectives, the vibration treatment has a valuable contribution to the recovery of discus shape (height and volume), to the relaxation of paravertebral muscles, to the diminishing of discus compression, diminishing of pain, improving the patients' quality of life;
- The unload of spine from its own weight by dorsal decubitus position diminishes compression on the intervertebral discus;
- Gaining muscular relaxation on paravertebral muscles through mechanic vibrations favours function recovery (discus shape and height) with spectacular effect of fighting back pain;
- Association of vibrations, under the above mentioned circumstances, to the kinetic treatment in order to obtain results superior to the simple kinetic treatment.

Hypotheses:

- Low and medium frequency mechanic vibrations applied to dorsal spine can contribute in a short time to the recovery of intervertebral discus shape and height, with

positive effects in the treatment of pain generated by discus origin rheumatic degenerative disorders of the dorsal spine.

- By associating low and medium mechanic vibrations to the kinetic treatment, there can be obtained results superior to those obtained through simple kinetic treatment, the vibrations essentially contributing to the improvement of functional indexes, of quality of life, to the diminishing of discomfort and to the decrease of treatment time.

Material and method:

We selected 50 patients, groups A, B, C, D, homogenous lots from the point of view of each patient's diagnosis (dorsarthrosis, dorsalgia), without associated diseases, aged between 18 and 29 years old, 13 patients each in groups A and B, and aged between 30 and 60 years old, 12 patients each in groups C and D with dorsal spine degenerative disorders (dorsarthrosis, dorsalgia) manifested or advanced.

During the 10 days of treatment, the patients followed the same treatment procedures. The kinetic treatment was divided into two halves, out of which during the first 5 days, kinetic treatment without vibrations and during the following 5 days, kinetic treatment followed by vibrations. The experiment was carried on in the Felix Spa Rehabilitation Clinical Hospital with the approval of the hospital's management and it was supervised by the primary physician BFT specialist, dr. Gheorghe Moraru during June 2009 and June 2010, with the apparatus of my own conception ***FELIX 1.*** (See fig. 1, photo 1).

Photo1

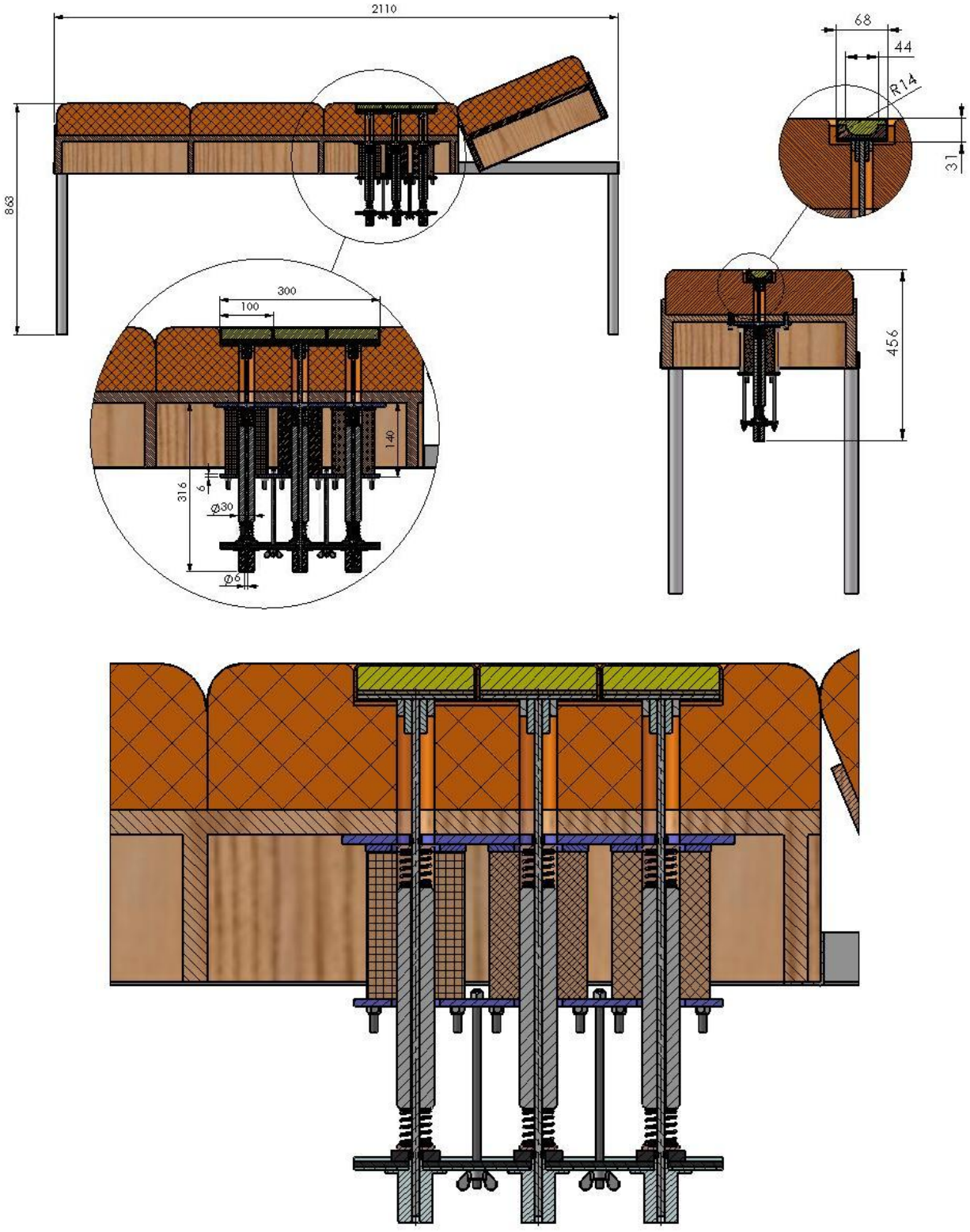

Fig. 1

Pain assessment:

It is a well-known that pain is a subjective factor; therefore it cannot be assessed otherwise than by taking this aspect into consideration. We asked the patients to assess their pain during the 10 days of treatment at the beginning and at the end of each kinetic

treatment session, on the ANALOG scale where 10 is the highest pain that the patient feels and the lower grades (under 10) represent residual pain after treatment. The pain assessment was made separately during the first 5 days of treatment (kinetic treatment without vibrations) and during the following 5 days of treatment (kinetic treatment followed by vibrations).

Vibrations parameters:

Frequencies, amplitude = vibration force and exposure times used during the experiment, were established together with the patient, him/her being an active part within the experiment. The vibrations were applied on the dorsal part of the spine between C 7 and T 12 (see photo 2):

- frequencies were between 1 Hz and 16 Hz, on one, two or all three vibrating segments;
- the amplitude was between 100 gr. force up to 1 kg force;
- exposure time to vibrations was between 4 and 12 minutes.

For the treated patients we used the dorsal decubitus position (lying on the back, see photo 2), position in which the spine and the vertebral discus are unloaded by trunk weight.

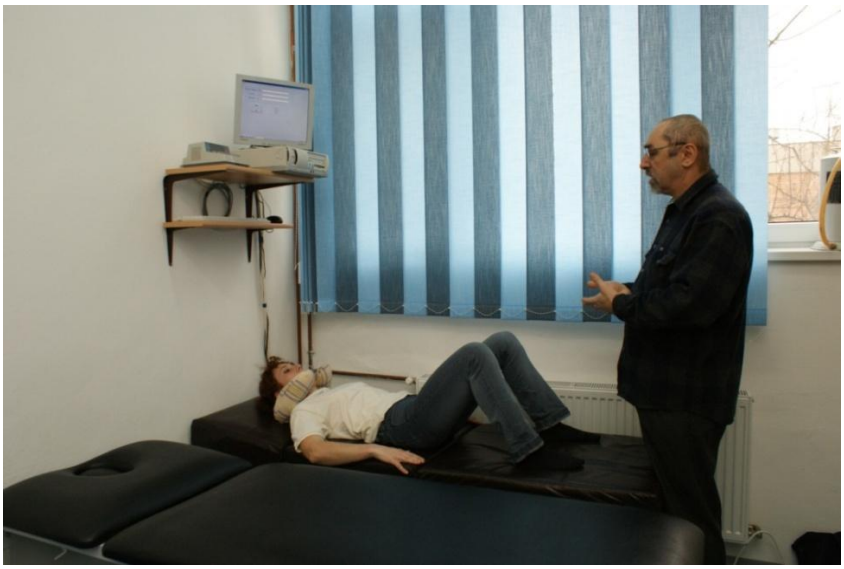

Photo 2

Results:

The numbers obtained and presented in the table represent the average of measurements made for each patient (13 or 12 patients x 5 days of kinetic treatment), both at admission in hospital and at discharge, before and after kinetic treatment, before and after vibration treatment.

After the 10 days of treatment on the PAIN component, we obtained the following results:

Group A = 13 men (18-29 years old): kinetic treatment without vibrations (first 5 days of treatment), the pain is the same, while after kinetic treatment followed by vibrations (the following 5 days of treatment), it decreases with 42%;

Group B = 13 women (18-29 years old): kinetic treatment without vibrations (first 5 days of treatment), pain decreases with 6.15%, while after kinetic treatment followed by vibrations (the following 5 days of treatment), it decreases with 41.3%.

Group C = 12 men (30-60 years old): kinetic treatment without vibrations (first 5 days of treatment), the pain is the same, while after kinetic treatment followed by vibrations (the following 5 days of treatment), it decreases with 41.1%;

Group D = 12 women (30-60 years old): kinetic treatment without vibrations (first 5 days of treatment), the pain is the same, while after kinetic treatment followed by vibrations (the following 5 days of treatment), it decreases with 37 %.

Out of these data, it results the un-debatable efficiency of vibrations in fighting pain caused by dorsarthrosis.

First of all, the decrease of pain is a direct effect of muscle relaxation induced by vibrations, obtained on the paravertebral muscles of the spine and second of all, the recovery effect in shape, height and functioning of intervertebral discus occurs under the influence of the same vibrations which are known to be the “cause of causes” of spine degenerative sufferings. Discus unloading through dorsal decubitus position and applying of controlled vibrations exactly under the dorsal spine brings simultaneously both muscular relaxation and the effects upon the discus.

CONCLUSIONS:

1) The treatment with mechanic vibrations is efficient; it can be applied easily and without risks upon the spine in case of pain caused by degenerative disorders, especially in initial phases, but also in advanced forms, with positive effects in fighting pain;

2) This type of treatment can be applied either separately as a single procedure or in combination with the kinetic treatment (preferably after it);

3) It has great therapeutic potential by stopping the evolution of these advanced forms of discus usage and by secondary prophylaxis of other rheumatic diseases of the spine such as forms of inflammatory rheumatism forms, especially during slack time and in initial forms of 1^{st} or 2^{nd} stages of evolution.

4) It has great prophylactic value, preventing the onset of certain chronic sufferings: partial loss of mobility, joint pain or discomfort.

5) Elderly people have noticeable results in using this type of treatment, however, more modest than those obtained by young individuals, fact which proves that it is efficient irrespective of age.

Bibliography:

1. Albu, C.,Gherguţ, A., Albu, M., (2007), Dicţionar de Kinetoterapie, Editura Polirom, Iaşi.
2. Arseni, C., Oprescu, I., (1982), Durerea, Editura Madicală. Bucureşti.
3. Banciu, M., (1996), Concepţii etiopatogenice în durerile reumatismale, Revista de Balneo şi Recuperare Medicală, Nr. 1şi2.
4. Brîndeu, L., Groşanu, I.(1986), Vibraţii mecanice, Inst. Polit. “T. Vuia”, Timişoara.
5. Chiriac, R., (1996), Stimularea electrică cu rol analgetic, Revista de Balneo şi Recuperare Medicală, Nr. 1;2.

6. Creţu, A., (2003), Ghid clinic şi therapeutic fizical-kinetic în bolile reumatice, Editura Bren, Bucureşti.
7. Diaconescu, N., Veleanu, C., Klepp, H,J., (1977), Coloana Vertebrală, Editura Medicală, Bucureşti.
8. Marcu, V., (1995), Bazele teoretice ale exerciţiilor fizice în kinetoterapie, Editura Universităţii, Oradea.
9. Marcu, V., Ciobanu, D.I. (2009), Exerciţiul fizic şi calitatea vieţii, studii şi cercetări, Editura Universităţii din Oradea.
10. Marcu, V., Pâncotan, V., (2005), Evaluarea bolnavilor în afecțiunile reumatice degenerative ale coloanei vertebrale, Editura Universităţii din Oradea.
11. Moraru, Gh., Pâncotan, V., (2008), Evaluare şi recuperare kinetică în reumatologie, Editura Universităţii din Oradea.
12. Pâncotan V., Revista Română de kinetoterapie (Nr. 22/2008), Aspecte esenţiale ale patologiei discului intervertebrat din zona lombară joasă şi profilaxia secundară a afecţiuniloe degenerative prin posturări şi kinetoterapie, Editura Universităţii din Oradea.
13. Safety Line Institute ISO, 2631-1:1997, (1998), Mecanical Vibration and Shock-vaves, Evaluation of human exposure to whole-body, vibration. Part 1, General Requirements.
14. Sbenghe, T., (1987), KINETOLOGIE, profilactică, terapeutică şi de recuperare, Editura Medicală, Bucureşti.
15. Şuţeanu, Şt.,Oancea, P., (1987), Actualităţi în anatomia, fiziologia şi patologia discului intervertebral lombar; implicaţii terapeutice, Agenda Medicală, Editura Medicală, Bucureşti.
16.*, Tache,Georgiana-Ozana, Medic primar Recuperare Medicală.**
17.*, www. Healty.ro/...../ vibraţie- vs-.fitness- clasic din 23 iulie 2007.**
18.*, www. Kineactu.com, Kine actualite (janvier 2010). Nr.1177-Interets therapeutiques de la vibrotonie.**